A RAIN HEAD

BACKGROUND OF THE INVENTION

This invention relates to a rain head.

Rain heads are located adjacent the underside of a roof gutter and are attached to an upper end of a downpipe. Rain heads are designed to provide a "safety break" between the downpipe and the roof gutter. This safety break ensures that in the event of a downpipe blockage or rain head blockage from the gutter, water can escape and spill onto the ground and thus prevent flooding of the eaves, wall cavity and the building.

When water from a roof of a building is captured for use and storage in a holding tank the quality of water is reduced by coliforms from animal matter and by turbidity.

Coliforms are the result of animal matter entering the tank whilst turbidity is a result of suspended solids like fine dust particles and vegetable matter.

In an attempt at reducing the presence of coliforms and reducing turbidity, known rain heads usually incorporate a single filter to exclude particles down to a size of about 955 microns. This is usually achieved by stainless steel mesh.

Screening in known rain heads is not particularly effective and these rain heads readily become blocked if not cleaned at relatively short intervals. Once a rain head becomes blocked, water which would otherwise be collected in the holding tank is lost.

OBJECT OF THE INVENTION

It is an object of the present invention to provide a

rainhead which at least minimises the disadvantages mentioned above.

SUMMARY OF THE INVENTION

According to one aspect the invention provides a rainhead having an inlet and an outlet, a primary filter through which water from the inlet may flow, a secondary filter through which water passing through the primary filter may flow and a tertiary filter located between the secondary filter and the outlet, the secondary filter filters smaller particles from the water than the primary filter and the tertiary filter filters smaller particles from the water than the secondary filter.

The primary filter is preferably a filter screen and may consist a stainless steel screen. The screen may consist of woven stainless steel. Preferably, the primary filter has apertures in the screen of between 4 to 6mm.

The secondary filter is preferably a filter screen and may consist a stainless steel screen. The screen may consists of woven stainless steel. Preferably the secondary filter has apertures of 1 to 1.5mm.

The tertiary filter preferably is constructed of a material that does not allow the direct flow of water through it from one side to the other. In one embodiment, the tertiary filter consists of one or more layers of geotextile fabric. Preferably a non-woven geotextile material is employed. In one embodiment the geotextile consists of non-woven polyester having a thickness of between 4.8 to 5.7mm per layer, a drop cone characteristic of between H_{50} 6400 to H_{20} 12600 per layer, a CBR burst strength of between 5100N@60% to 9600N@60% per layer, a tensile strength of between 33kN/m x D/18kN/m MD to 68kN/m x D/38kN/m MD per layer, a pore size between 100mm to 90m per layer and a flow rate of between $80Lm^2/_s$ to $65Lm^2/_s$ per layer. Preferably the

tertiary filter separates particles down to 50 micron from the water that passes through it.

The filters may extend in a planar fashion across the rain head. Preferably, at least the primary and secondary filters may be raked and arranged so that they have a central peaked zone and extend from that zone at an inclined angle. In this way, particles trapped by these filters may wash to the sides away from the central peaked zone to thereby increase the efficiency of the rain head and extend the time between maintenance of the rain head.

Preferably the rain head has a stepped peripheral wall and the filters may rest upon inwardly directed steps of the inside of the wall.

The rain head has a downpipe connecting portion extending therefrom which provides the outlet from the rain head. The connecting portion may consist of a spigot. Preferably, the connecting portion consists of two spigots and the spigots may be concentrically aligned relative to one another.

A downpipe may be received in the space between the two spigots with either the outer face of the downpipe abutting the inside of the outer spigot or the inside of the downpipe abutting the outer face of the inside spigot. Alternatively, the inside of a downpipe may abut the outer face of the outside spigot.

DESCRIPTION OF THE DRAWINGS

Figure 1 shows a bottom perspective view of a known rain head;

Figure 2 shows a plan view of the rain head of figure 1;

Figure 3 shows an inverted plan view of the rain head of figure 1;

Figure 4 is a transverse sectional view of a rain head according to one embodiment of the invention; and ,

Figure 5 is a transverse sectional view of a rain head according to another embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

Figures 1 to 3 show a known rain head 10 having a substantially rectangular body with downwardly sploping walls 11, 12, 13 on three sides and a substantially perpendicular rear wall 14.

The base 15 of the rain head 10 is substantially horizontal and includes an outlet 16 formed centrally therewith. The outlet 16 is defined by two spigots 17, 18 each having a common central axis with the other. The spigots 17, 18 have a circular configuration for attachment to a downpipe by press fitting either with or without the use of an adhesive.

Figure 4 shows a vertical sectional view through a rain head 20 according to one embodiment of the invention. The rain head 20 has downwardly sloping sides 21, 22. Three of the sides may slope downwardly as shown and the rear side may be substantially perpendicular like the prior rain head of figures 1 to 3. The rain head 20 has an open top or inlet and an outlet 23 defined by spigots 24, 25. The spigots 24, 25 have a common central axis and are concentrically arranged relative to one another and define a space 26 between them.

The sides 21, 22 are stepped at 27 and 28. A lower part of the rain head 20 has a downwardly sloping wall 29 from which the spigots 24, 25 extend.

In figure 4 a primary filter 30 rests upon step 27. A

tertiary filter 31 rests upon step 28. A secondary filter 32 is located between the primary and tertiary filters and is spaced from them and extends between sides 21, 22.

Water may enter through the open top of the rain head and progressively passes through filters 30, 32 and 31 and progressively smaller particles are separated from the water before it exits through outlet 23. By having three filters arranged in this way it is possible to have longer intervals at which the filters are removed and cleaned. Likewise, unlike with a single screen where relatively small particles may pass and the single screen may clog quickly the provision of multiple screens of progressively smaller aperture size, the danger of clogging is lessened and relatively small particles may still be separated from the water by the tertiary filter.

Figure 5 shows a transverse sectional view of a rain head 20 like that shown in figure 4 and like numerals are used to denote like parts. In this embodiment the primary filter 40 is raked and has a peaked portion 41 and downwardly inclined portions 42, 43. Large particles caught by filter 40 may be washed to the sides to minimise restriction of water flow through the filter 40. Likewise, secondary filter 45 may also be raked and has a peaked portion 46 with downwardly inclined portions 47, 48. A tertiary filter 49 is also present.

By having three filters of this type the larger debris or particles is progressively filtered from the water and the tendancy for blocking is lessened. Longer intervals between cleaning of the filters is possible than was the case with prior rain heads and more effective filtering of the water is achieved.